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RECENT TRENDS IN DEGREES
AWARDED AND ENROLMENTS AT
CANADIAN UNIVERSITIES



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SUMMARY

This paper reviews the recent trends in university enrolments and degrees awarded in order to obtain a better understanding of the current capacity of the university system for generating highly qualified manpower. The study also assesses the trends in the number of university graduates that are available on the job market.

Total university enrolments in full-time equivalents (FTE) and degrees awarded increased by 3% per annum from 1972 to 1978. This is in marked contrast to the expansion of the 1960s when enrolments grew by 12% per year (from 1960-61 to 1970-71).

At the undergraduate level, full-time enrolments and degrees awarded in the applied fields grew at a much faster pace (5-6% per year) than the general arts and science fields (2-3% per year) over the period 1972 to 1978.

At the graduate level, enrolments (FTE) and degrees awarded grew at about 3% per annum over the period 1972 to 1978. In recent years, graduate full-time enrolments have begun to decrease (1977 and 1978), both in the applied and the pure science fields. Major exceptions to this pattern were the education and commerce fields where degrees awarded grew by 9% and 11% per year respectively (1972 to 1977).

Taking into account such factors as foreign students, immigration, Canadians with degrees from abroad, etc., it is estimated that over the period 1972-73 to 1977-78 the supply of persons with university degrees potentially available on the job market grew at about 4% per year at the undergraduate level, with the number remaining almost constant in engineering, physical sciences and mathematics, humanities and fine arts and the social sciences. At the graduate level, the number also remained constant over the period 1972-73 to 1977-78, with decreases in the fields of engineering and applied sciences, life sciences, physical sciences and mathematics, health sciences and humanities and fine arts; and increases in education, social sciences, law and commerce.

Male full-time undergraduate enrolments grew slowly from 1972 to 1978 and male full-time graduate enrolments decreased over this period. Female full-time undergraduate and graduate enrolments grew steadily over this period, both in the applied and pure science fields.

Part-time enrolments grew steadily over the period 1972 to 1978 at the graduate and undergraduate levels for males, but particularly for females.

There was a general expansion in the foreign student population over the period 1972 to 1978. Undergraduate foreign student enrolments increased by 113%. The proportion of foreign student enrolment to total enrolment increased from 3% to 5% over this period. Graduate foreign student enrolment increased by 116%, with the proportion of total enrolment rising from 8% to 14%. The growth took place in all fields except the humanities and fine arts, and the social sciences. In 1978, the proportion of foreign students was 30% in engineering and applied sciences, and 28% in mathematics and physical sciences.

On a regional basis, in 1978 some 45% of the degrees awarded at the undergraduate level came from Ontario, 23% from Quebec, 23% from the Western provinces and 10% from the Atlantic provinces. Over the period 1974 to 1978 the number of undergraduate degrees awarded decreased in the Atlantic provinces, and grew by 6%-7% in Quebec and Ontario, and 3% in the Western provinces. The share of graduates from Quebec and Ontario increased in the human and natural sciences and the share of graduates from the health sciences increased in the Western provinces over this same period.

At the graduate level, in 1978 half the graduates came from Ontario, followed by Quebec (24%), the Western provinces (20%) and the Atlantic provinces (6%). Over the period 1972 to 1978, the share of graduates from Quebec increased from 18% to 24%. The share decreased from Ontario (53% to 50%) and the Western region (24% to 20%). The proportion of graduates from the Atlantic region increased slightly from 5% to 6%.

Looking at concentration by size of university at the undergraduate level, 20 universities accounted for 78% of all enrolments in 1977, with the other 28 universities accounting for the remainder. Similarly, 89% of graduate enrolment was concentrated in 20 universities in that year.

INTRODUCTION

This study reviews the recent trends in university enrolments and degrees awarded. The purpose of the review is to obtain a better understanding of the current capacity of the university system for generating highly qualified manpower. This study also assesses the trends in the number of university graduates that are available on the labour market, by reviewing the number of foreign students in Canada, the number of immigrants, and the number of Canadian graduates who are obtaining degrees abroad. Such supply estimates are essential in determining future requirements/supply balances under various R&D scenarios.

The study is divided into 4 sections. The first provides a description of the general trends in the growth of enrolments and degrees awarded at the undergraduate and graduate levels. Also contained in this section is a discussion of the major factors influencing these trends. The second part details the relative growth in enrolments and degrees awarded within the major disciplinary groups. A regional analysis is provided in the third section. The fourth part briefly describes the growth in the number of graduates classified by university of graduation.

I TRENDS IN TOTAL ENROLMENTS AND DEGREES AWARDED

(1) Undergraduate Degrees Awarded and Enrolments

Undergraduate enrolments (FTE) and degrees awarded increased by 3-4% per year over the period 1972 to 1978 (Table 1). Total full-time enrolments actually declined from 1976 to 1978. This is a rather dramatic shift in the trends of enrolments and degrees awarded when compared to the 1960s. For example, over the period 1961-62 to 1970-71 total bachelor and first professional degrees awarded grew at an average annual rate of 12%.

A number of factors have influenced these overall trends in the growth and composition of undergraduate enrolments, and thus degrees awarded, over the 1970s:

- (i) A gradual reduction in the full-time male undergraduate participation rates⁽¹⁾ from 1972-73 to 1975-76, and then a more pronounced decrease over the two years 1976-77 and 1977-78. This was the major factor contributing to a reduced growth between 1972-73 and 1975-76, and actual declines in 1976-77 and 1977-78, in male undergraduate enrolments. More detail is provided in Table 2.
- (ii) A significant increase in the participation rates of female full-time undergraduates from 1972-73 to 1977-78. This was the major reason for the increase in female full-time enrolments from 103,000 to 141,000 over the same period (see Table 2).
- (iii) A continued increase in the male, and particularly female, part-time participation rates. This was the main factor accounting for the expansion in part-time enrolments (see Table 3).

(1) Participation rate is defined as the proportion of students within a specified basic population group. In this study, participation rates are used for various categories of enrolment within which participation behaviour is relatively homogenous (e.g., full-time undergraduate males, etc.). See Appendix A for a more detailed description of participation rates.

- (iv) An expansion in the male and especially the female full-time enrolments at community colleges - institutions which represent a viable alternative to universities (see Table 4).
- (v) A continuing increase in the post-secondary population age groups.
- (vi) An increase in total undergraduate foreign (student visa) enrolments of 113% over the period 1972-73 to 1977-78. In relative terms, the percentage of foreign student enrolment to total enrolment increased from 3% to 5% over this period (see Table 5).

(2) Graduate Enrolments and Degrees Awarded

Over the period 1972 to 1978 the growth in graduate enrolments (FTE) and degrees awarded increased at 3% per year. Full-time enrolments actually decreased between 1977 and 1978 (Table 6).

A number of factors have influenced the overall level and composition of these enrolment trends, and the major influences are summarized below:

- (i) Since the early 1970s, the participation rates of male full-time graduates have fallen significantly. This has been the major factor in the precipitous decline of male full-time enrolments from 26,400 in 1972-73 to 18,700 in 1977-78 (see Table 7).
- (ii) Over the 1970s female full-time graduate enrolment grew by 24%, from 8,456 in 1972-73 to 10,454 in 1977-78. The main reason for this growth was the increase in the source population base rather than an increase in the participation rates, which grew by less than 7% throughout this period (see Table 7).
- (iii) Male part-time enrolments increased rather steadily from 1972-73 to 1975-76 and then decreased to 1977-78 (as shown in Table 8). Although the participation rates followed this same trend the main reason for the relative increase in male part-time enrolments was the growth in the population base.

- (iv) Female part-time enrolments increased from 4,900 in 1972-73 to 9,500 in 1977-78, as shown in Table 8. The main reason for this development was the general increase in participation rates.
- (v) One of the most significant features in graduate enrolment trends has been the relative growth in foreign students (Table 9). In 1972-73, 8% of the total enrolment was foreign students and by 1977-78 this proportion had increased to 14%. This growth took place mainly in agriculture and biological sciences, mathematics and physical sciences and engineering and applied sciences. More details are provided in Table 10.

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Enrolments (FTE)¹

¹Full-time equivalent enrolment is calculated on the basis that 3.75 part-time undergraduate enrolments equals 1 full-time enrolment.

SOURCE: Statistics Canada, "Universities: Enrolment and Degrees", Cat. No. 81-204, Annual, 1972-1978 and "Degrees, Diplomas and Certificates Awarded by Universities", Cat. No. 81-211, Annual, 1972-75, Education, Science and Culture Division, Ottawa.

TABLE 2

FULL-TIME UNDERGRADUATE ENROLMENTS AND PARTICIPATION RATES

| | <u>MALES</u> | | <u>FEMALES</u> | |
|---------|-------------------|--|-------------------|--|
| | <u>ENROLMENTS</u> | <u>RATIO OF PART. RATE TO BASE YEAR (1978)</u> | <u>ENROLMENTS</u> | <u>RATIO OF PART. RATE TO BASE YEAR (1978)</u> |
| 1972-73 | 163,583 | 108.4 | 103,020 | 81.6 |
| 1973-74 | 167,877 | 107.8 | 111,075 | 86.1 |
| 1974-75 | 171,464 | 106.8 | 122,050 | 92.5 |
| 1975-76 | 176,950 | 107.1 | 134,963 | 99.9 |
| 1976-77 | 174,430 | 105.0 | 139,297 | 100.6 |
| 1977-78 | 170,644 | 100.0 | 141,052 | 100.0 |

NOTE: The methodology used to calculate participation rates is explained in Appendix A.

SOURCE: MOSST, "University Enrolment Projections to 2000", Background Paper No. 15, (these estimates exclude foreign students).

TABLE 3

PART-TIME UNDERGRADUATE ENROLMENTS AND PARTICIPATION RATES

| | <u>MALES</u> | | <u>FEMALES</u> | |
|---------|-------------------|--|-------------------|--|
| | <u>ENROLMENTS</u> | <u>RATIO OF PART. RATE TO BASE YEAR (1978)</u> | <u>ENROLMENTS</u> | <u>RATIO OF PART. RATE TO BASE YEAR (1978)</u> |
| 1972-73 | 58,125 | 90.9 | 65,358 | 73.4 |
| 1973-74 | 57,128 | 86.6 | 70,940 | 77.5 |
| 1974-75 | 60,372 | 88.7 | 78,079 | 82.9 |
| 1975-76 | 67,518 | 96.1 | 86,179 | 89.1 |
| 1976-77 | 69,132 | 95.4 | 89,598 | 89.4 |
| 1977-78 | 74,557 | 100.0 | 102,887 | 100.0 |

NOTE: The methodology used to calculate participation rates is explained in Appendix A.

SOURCE: MOSST, "University Enrolment Projections to 2000", Background Paper No. 15.

TABLE 4

COMMUNITY COLLEGE (FULL-TIME)

| | <u>MALE TRANSFER</u> | <u>FEMALE TRANSFER</u> | <u>MALE CAREER</u> | <u>FEMALE CAREER</u> |
|---------|--------------------------|----------------------------|------------------------|--------------------------|
| 1972-73 | 38,286 | 24,933 | 62,931 | 47,089 |
| 1973-74 | 41,323 | 27,200 | 65,810 | 60,011 |
| 1974-75 | 41,102 | 31,235 | 65,023 | 66,945 |
| 1975-76 | 41,499 | 32,977 | 70,895 | 69,501 |
| 1976-77 | 42,722 | 33,797 | 71,662 | 73,497 |
| 1977-78 | 44,679 | 37,792 | 73,909 | 78,755 |

NOTE: Transfer students are those in community colleges who are enrolled in one or two-year academic programs after which students may proceed to university. Career or terminal students are those in community colleges who are enrolled in vocationally oriented programs which provide students with a recognized diploma or certificate, and which normally do not lead to further post-secondary study.

SOURCE: MOSST, "University Enrolment Projections to 2000", Background Paper No. 15.

TABLE 5

(1)

UNDERGRADUATE FOREIGN STUDENT ENROLMENT (FTE)

1972-73 - 1977-78

| <u>YEAR</u> | <u>FTE STUDENT VISAS</u> | <u>% OF STUDENT¹ VISAS TO TOTAL ENROL. (FTE)</u> |
|-------------|------------------------------|---|
| 1972-73 | 6948 | 2.5 |
| 1973-74 | 6438 | 2.2 |
| 1974-75 | 7084 | 2.3 |
| 1975-76 | 10569 | 3.5 |
| 1976-77 | 12376 | 3.6 |
| 1977-78 | 14852 | 4.4 |
| 1978-79 | 14811 | 4.5 |

NOTE: ¹Full-time equivalent enrolment is calculated on the basis that 3.75 part-time undergraduate enrolments equals 1 full-time enrolment.

SOURCE: Data obtained from Statistics Canada, Education, Science and Culture Division, Ottawa and Table 1 above.

TABLE 6

GRADUATE ENROLMENT AND DEGREES AWARDED 1972-1978

| | <u>1972</u> | <u>1973</u> | <u>1974</u> | <u>1975</u> | <u>1976</u> | <u>1977</u> | <u>1978</u> |
|-------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Enrolments (FTE) ¹ | 36339 | 37617 | 39684 | 42451 | 43285 | 43983 | 43987 |
| Full-time | 29327 | 29540 | 31296 | 33175 | 33865 | 34398 | 34275 |
| Part-time | 17530 | 20192 | 20970 | 23190 | 23551 | 23962 | 24279 |
| Degrees Awarded | 11982 | 12559 | 12092 | 12908 | 13245 | 14081 | 14456 |

NOTE: ¹Full-time equivalent enrolment is calculated on the basis that 2.5 part-time graduate enrolments equals 1 full-time enrolment.

SOURCE: Statistics Canada, "University: Enrolments and Degrees", Cat. No. 81-204, Annual, 1972-1978 and "Degrees, Diplomas and Certificates Awarded by Universities", Cat. No. 81-211, Annual, 1972-75, Education, Science and Culture Division, Ottawa.

TABLE 7

FULL-TIME GRADUATE ENROLMENTS AND PARTICIPATION RATES

| | <u>MALES</u> | | <u>FEMALES</u> | |
|---------|-------------------|---|-------------------|---|
| | <u>ENROLMENTS</u> | <u>RATIO OF PART. RATES TO BASE YEAR (1978)</u> | <u>ENROLMENTS</u> | <u>RATIO OF PART. RATES TO BASE YEAR (1978)</u> |
| 1972-73 | 26,446 | 165.8 | 8,456 | 93.6 |
| 1973-74 | 26,141 | 155.3 | 8,984 | 96.4 |
| 1974-75 | 21,584 | 125.7 | 8,666 | 90.0 |
| 1975-76 | 21,486 | 121.1 | 9,746 | 98.5 |
| 1976-77 | 19,585 | 107.5 | 10,021 | 98.6 |
| 1977-78 | 18,740 | 100.0 | 10,454 | 100.0 |

NOTE: The methodology used to calculate participation rates is explained in Appendix A.

SOURCE: MOSST, "University Enrolment Projections to 2000", Background Paper No. 15, (these estimates exclude foreign students).

TABLE 8

PART-TIME GRADUATE ENROLMENTS AND PARTICIPATION RATES

| | <u>MALES</u> | | <u>FEMALES</u> | |
|---------|-------------------|---|-------------------|---|
| | <u>ENROLMENTS</u> | <u>RATIO OF PART. RATES TO BASE YEAR (1978)</u> | <u>ENROLMENTS</u> | <u>RATIO OF PART. RATES TO BASE YEAR (1978)</u> |
| 1972-73 | 14,601 | 97.2 | 4,923 | 60.1 |
| 1973-74 | 16,340 | 105.5 | 6,139 | 72.7 |
| 1974-75 | 16,917 | 105.9 | 6,721 | 77.4 |
| 1975-76 | 18,017 | 109.4 | 7,901 | 88.5 |
| 1976-77 | 17,968 | 104.4 | 8,738 | 94.4 |
| 1977-78 | 17,710 | 100.0 | 9,512 | 100.0 |

NOTE: The methodology used to calculate participation rates is explained in Appendix A.

SOURCE: MOSST, "University Enrolment Projections to 2000", Background Paper No. 15, (these estimates exclude foreign students).

TABLE 9

GRADUATE FOREIGN STUDENT ENROLMENT (FTE)¹

| <u>YEAR</u> | <u>STUDENT VISAS</u> | <u>% OF STUDENT VISAS TO TOTAL ENROLMENT</u> |
|-------------|----------------------|--|
| 1972-73 | 2950 | 8.1 |
| 1973-74 | 2451 | 6.5 |
| 1974-75 | 3487 | 8.8 |
| 1975-76 | 4403 | 10.4 |
| 1976-77 | 5106 | 11.8 |
| 1977-78 | 5975 | 13.6 |
| 1978-79 | 6017 | 13.7 |

NOTE: ¹ Full-time equivalent enrolment is calculated on the basis that 2.5 part-time graduate enrolments equals 1 full-time enrolment.

SOURCE: Data obtained from Statistics Canada, Education, Science and Culture Division, Ottawa and Table 6 above.

TABLE 10

% FULL-TIME GRADUATE FOREIGN STUDENTS OF FULL-TIME

GRADUATE STUDENTS BY FIELD OF STUDY

1972-73 - 1978-79

| <u>FIELD OF STUDY</u> | <u>1972- 1973</u> | <u>1973- 1974</u> | <u>1974- 1975</u> | <u>1975- 1976</u> | <u>1976- 1977</u> | <u>1977- 1978</u> | <u>1978- 1979</u> |
|---------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Education | 5.5 | 4.0 | 5.9 | 5.7 | 8.1 | 9.6 | 10.0 |
| Humanities & Fine Arts | 9.2 | 5.7 | 10.0 | 10.6 | 11.5 | 12.8 | 12.1 |
| Social Sciences ¹ | 8.2 | 7.9 | 9.5 | 12.0 | 13.9 | 15.1 | 10.9 |
| Agric. & Biol. Sc. ² | 10.1 | 11.7 | 10.5 | 16.3 | 17.6 | 18.9 | 17.9 |
| Eng. & Applied Sc. | 16.5 | 15.3 | 18.8 | 22.1 | 22.0 | 27.6 | 30.3 |
| Math. & Physical Sc. | 10.5 | 10.1 | 12.0 | 17.1 | 21.5 | 25.3 | 28.0 |
| Health | 6.1 | 4.6 | 5.8 | 7.5 | 8.8 | 11.4 | 11.0 |

¹Includes law and commerce

²Includes forestry

SOURCE: Statistics Canada, "Universities: Enrolment and Degrees",
Cat. No. 81-204, Annual, 1972-73 to 1978 and data obtained
from Education, Science and Culture Division, Ottawa.

II ENROLMENTS AND DEGREES AWARDED BY DISCIPLINE

(1) Undergraduate Level

Tables 11 to 19 show full-time enrolments (where available), degrees awarded and an estimate of the number of graduates who were available to take jobs, by major disciplinary group. The number of job seekers is a MOSST estimate, based on the number of degrees awarded and adjusted for such factors as foreign students, graduates continuing their studies instead of seeking employment, immigration, etc. (See Appendix B for details on these adjustments.)

The number of degrees awarded in the natural sciences, which include the physical sciences, engineering and the life sciences, grew at a 4% annual rate, from 13,200 in 1972-73 to 16,600 in 1978-79 (see Table 11). The estimated number of students available for employment increased at an annual rate of 2% from 11,400 to 12,800 over the same period. Two major factors account for the difference between degrees awarded and the number of job seekers:

- (i) a relative decrease in the number of degrees awarded to foreign students who are required to leave Canada after completion of their degrees; and
- (ii) a relative decrease in the number of immigrants. More details are shown in Appendix B, Tables B-1 and B-2.

Undergraduate enrolments in the engineering and applied sciences were almost constant from 1972 to 1974 but then began to rise steadily from 24,200 in 1974-75 to 32,100 in 1978-79. Degrees awarded showed no increase from 1972-73 to 1975-76 but then started to increase over the next three years reflecting the enrolment growth which began in the mid 1970s. The proportion of female degree holders in engineering was low (4% in 1977) in comparison to other fields and remained low over the 1970s. The proportion of undergraduates in engineering continuing their education full-time fell from 19% in 1972 to 15% in 1977. In the other natural sciences, the proportion continuing their education on a full-time basis fell from 26% to 24%. More information on enrolments and degrees awarded at the undergraduate level in engineering and applied sciences is given in Table 12 and Appendix Tables C-3, B-1 and B-2.

The number of undergraduate degrees awarded in the life sciences grew by 6% annually, from 4,500 in 1972 to 6,500 in 1978 (see Table 13). Most of this growth took place in the latter half of the 1970s and was largely due to an increase in the number of females. Degrees awarded to females grew by 19% yearly from 1972 to 1977. It is estimated that about 30% of all undergraduate degree holders in 1977 continued their education on a full-time basis. This proportion showed little change over the 1970s reflecting student preferences to continue their education. The estimated number of first degree holders potentially available to enter the job market, therefore, was correspondingly lower than the total number of degrees awarded over the 1970s. More details are shown in Appendix Tables B-1 and B-2.

Unlike engineering and the life sciences, the number of graduates from the physical sciences remained constant at about 4,200 over the period 1972 to 1978 (see Table 14).

Full-time undergraduate degrees awarded, and the estimated number of job seekers in the humanities and fine arts, increased marginally (2% per year) over the period 1972 to 1978. More details are shown in Table 15 and Appendix Tables B-1 and B-2.

In the health-related fields, full-time enrolments grew by 20%, while the number of degrees awarded and potential job seekers grew by nearly 50% over the period 1972 to 1977. The main reason for this discrepancy was the rapid growth in degrees awarded from 1972 to 1974 reflecting a high enrolment growth in the late 1960s and early 1970s. After 1974 degrees awarded grew by 10% and actually decreased between 1977 and 1978. More details are shown in Table 16 and Appendix Tables B-1 and B-2.

Full-time enrolments and degrees awarded in the education fields increased steadily at 2-3% yearly over the period 1972-78. Enrolments decreased in 1977 and 1978, and degrees awarded decreased in 1978 (see Table 17).

Degrees awarded in the social sciences increased by 2% per annum over the period 1972 to 1978. The potential number of job seekers is estimated to have increased little over the period. More details are shown in Table 18 and Appendix Tables B-1 and B-2.

Full-time enrolments and degrees awarded in the law and commerce fields increased rapidly over the 1970s, with enrolments increasing by 8% per year and degrees awarded at an even faster pace of 11% per year from 1972 to 1978. Undergraduate degrees awarded to females in these fields grew from 10% of the total in 1972 to 24% of the total in 1977. More details are provided in Table 19 and Appendix Tables B-1, B-2 and C-3.

Data for the individual fields of study shown in Tables 11 to 19 have been grouped into two categories. The first, general arts and science, includes the following disciplines: general arts, social sciences, humanities and fine arts, physical sciences and mathematics, and the life sciences. The second group consists of the more applied programs and includes: health, engineering, education, law, commerce, veterinary medicine, computer science and social work. Trends in these two broader groupings are discussed in the following section. The reason for the regrouping is to obtain an insight into the difference in trends related to the applied and career-oriented disciplines as compared with trends in the non-applied areas.

(a) General Arts and Science

Total full-time enrolments in these fields increased only marginally over the period 1972 to 1978, as shown in Table 20. Enrolments showed an actual decline from 1976 to 1978. The number of degrees awarded increased at a relatively low pace over the period 1972-78.

The trends in undergraduate general arts and science graduations have been associated with a number of inter-related factors. The growth rate in the 18-24 age group decreased to about 3% per annum over the 1970s, from a 4-5% yearly growth rate over the 1960s. Some 90% of the general arts and science enrolments is in the 18-24 age group, and thus the reduced growth in this age group has had a more pronounced affect on these fields than on other disciplines with different age compositions.

Judging from the results of recent surveys, job opportunities are a major concern of university students⁽²⁾. Throughout the 1970s, the unemployment rate for all university graduates was consistently lower than for those without university qualifications. Even within the youth age group (15-24), unemployment for university graduates was lower than for the other educational groups⁽³⁾. Nevertheless, several studies have indicated that, over the 1970s, larger proportions of university students from the general arts and science fields have been experiencing difficulty finding employment than graduates from other fields⁽⁴⁾.

The third major factor associated with the trends in enrolments and degrees awarded of the general arts and science graduates has been the rapid growth in the community college system. Some have argued that this is a reflection of a gradual shift in student preferences away from the general programs offered by the universities⁽⁵⁾.

(2) A recent survey by the Secretary of State Department indicated that 14% of the university students sampled cited employment prospects and 23% cited career advancement as the most important reasons for choosing a particular program (see, "Some characteristics of post-secondary students in Canada", Education Support Branch, Department of the Secretary of State). In a survey conducted at the University of Western Ontario, 70% of the undergraduate students who responded felt university enrolment should be limited because of job market conditions (see "Western News", 14(13), March 30, 1978).

(3) See, Statistics Canada, "The Labour Force", December 1977.

(4) See for example, Office of Student Services, "Post graduation activities of 1975 UBC graduates in selected faculties". University of British Columbia, February, 1976; "Future Trends in Enrolment and Manpower Supply in Ontario", Z. Zsigmond et. al., Statistics Canada, Ottawa, 1976; and "Employment of 1976 University and College Graduates"; Education, Science and Culture Division, Statistics Canada.

(5) See, for example, National Union of Students, "Education: a system in chaos, a case for planned education", March 1979.

The growth in female participation rates, on the other hand, has offset the negative effects on enrolments due to the slowdown in the 18-24 age group, the weak job market, and the rising preference for community college training. For example, 40% of the graduates in 1972 were women; and by 1977 this proportion had increased to 50%. More details are provided in Appendix Tables C-1, C-3, B-1 and B-2.

(b) Career-oriented Programs

Due to occupational and institutional requirements, the number of students permitted into the career-oriented or applied disciplines is controlled. The particular method of control varies from discipline to discipline and from province to province. For example, engineering and commerce and business programs are restricted in Alberta, Saskatchewan, Manitoba, Toronto, Queen's and Montreal. In most universities this is accomplished through a quota system and a floating grade requirement⁽⁶⁾. Education faculties and nursing schools restrict enrolments in all universities. Interviews and/or written language tests and available places are the methods used to control the number of entrants for these fields. In the case of law, medicine and dentistry, not only are enrolments controlled through professional examinations, but the absolute number of available places acts as the most influential control mechanism.

Despite these controls, enrolments and the number of graduations from the career-oriented fields increased at a much faster pace than the supply of graduates from the general arts and science fields. In total, enrolments and the number of graduates from these fields grew at an average annual rate of 5-6% per year from 1972 to 1978. This growth was not much different from that of the 1960s. More details on enrolments and degrees awarded in the applied fields of study are given in Table 20.

A major characteristic of this growth has been the increased participation of women. Proportionately more females have been entering these historically male-dominated fields. For example, the proportion of females graduating in the applied fields increased from 37% of the total in 1972 to 45% in 1977. Appendix Table C-3 provides more data on female degrees awarded.

(6) At present, Dalhousie is one exception. While operating at full capacity it does accept all qualified applicants.

The particular pattern of growth between 1972 and 1978 within the various applied fields depended on a mix of institutional and labour market factors. In the case of engineering, the supply was largely a function of labour market requirements. The number of graduates grew at about 4% per year which was sufficient to maintain a relatively balanced market. The number of graduates from the health and law fields grew at about 7% and 4% per year respectively, and this growth was mainly a function of available places within the professional schools. In general, many more people applied for these programs than the schools could accommodate. However, the schools in close consultation with the respective professional associations limited the number of openings in line with respective needs and costs of operating such professional schools.

The number of graduates in commerce and business grew at a rapid pace of 14% per year over the 1970s. This trend reflected the favourable market situation for the graduates in these fields. In the case of education, the number of graduates grew at about 3% per year. This was a dramatic change from the 17% annual growth rate over the 1960s. Lack of jobs in education due to the decline in the elementary and secondary school population, combined with the increased tendency by schools of education to reduce costs, were major factors accounting for this slowdown in the growth rate of the number of graduates.

(ii) Graduate Level

Enrolments and degrees awarded at the graduate level are shown in Tables 21 to 29 for the years 1972-73 to 1978-79. Also contained in these tables is an estimate of the number of potential job seekers, estimated with the aid of the methodology described in Appendix B.

Full-time masters enrolments in the natural sciences increased up to the year 1976-77 and then decreased to 1978-79. Full-time Ph.D. enrolments in the natural sciences decreased from a level of 4,300 in 1972-73 to 3,400 in 1978-79. Masters degrees awarded showed no significant increase from 1972 to 1978. Ph.D. degrees awarded decreased by 3% per annum from 1972 to 1977.

The estimated number of potential job seekers in the natural sciences decreased at a faster pace than degrees awarded over the period 1972 to 1977. This was mainly due to the estimated increase in degrees awarded to foreign

students (who are expected to leave the country after graduation), a slight increase in the number of degrees awarded to part-time students (who already have jobs), and a decrease in the number of immigrant degree holders. Further details on the natural science fields are shown in Tables 21, 22, 23 and 24, and in Appendix B, Tables B-3 and B-4.

Although full-time masters enrolments in the humanities and fine arts increased from 1972 to 1978, degrees awarded showed a marginal decline. At the Ph.D. level, full-time enrolments decreased slightly over the period 1972-73 to 1978-79, whereas degrees awarded increased from 200 in 1972 to 300 in 1975 and then decreased to 270 by 1978. Total graduate degrees awarded, and the number of potential job seekers, in the humanities and fine arts decreased marginally from 1972 to 1978. Further details are shown in Table 25 and Appendix B, Tables B-3 and B-4.

Both full-time masters enrolments and degrees awarded in the health fields increased over the 1970s - yearly enrolments grew from 570 in 1972-73 to 1,210 in 1978-79, and degrees awarded from 310 in 1972-73 to 520 in 1978-79. Ph.D. enrolments in the health fields decreased from 1972 to 1976 and then increased gradually for 1977-78 and 1978-79. Ph.D. degrees awarded gradually declined over the period 1972-73 to 1977-78 and increased slightly for 1978-79. Masters degrees increased from 313 to 517 over the period 1972-73 to 1978-79. In total, graduate degrees awarded increased 6% annually over the period 1972-73 to 1978-79. The estimated number of job seekers decreased, however, due to a slight increase in the number of degrees awarded to foreign and part-time students and a decrease in the number of immigrants. More detail is provided in Table 26 and Appendix Tables B-3 and B-4.

Full-time enrolments and degrees awarded at both the masters and Ph.D. levels increased rather steadily over the 1970s in the education and social science fields. In total, graduate degrees awarded increased yearly at about 8% from 1972 to 1978 for education. Much of this expansion could be accounted for by the growth in degrees to females. The proportion of degrees awarded to women grew from 28% in 1972 to 38% in 1977. In the social sciences, degrees awarded increased at 4% per year, whereas the number of potential job seekers remained relatively constant due to the increase in the number of degrees awarded to foreign students who are required to leave the country after graduation. More detail on enrolments and degrees awarded in these two fields of study is provided in Tables 27 and 28, and Appendix Tables B-3, B-4, C-2 and C-4.

At the masters level, full-time enrolments and degrees awarded increased significantly in the law and commerce fields during the 1970s. Ph.D. enrolments increased slightly, and growth in the number of degrees awarded remained relatively constant over the 1972-73 to 1978-79 period. The proportion of graduate degrees awarded to women in the commerce fields increased from 3% in 1972 to 14% in 1977. More details on enrolments and degrees awarded are shown in Table 29 and Appendix Tables B-3, B-4 and C-4.

The fields of study shown in the above tables are again divided into two groups. The disciplines included in the first group are the basic or fundamental sciences which include the social sciences, humanities and fine arts, physical sciences and mathematics and the life sciences. The second group is composed of the more applied fields of health, engineering, education, law, commerce, veterinary medicine, computer science and social work.

The number of enrolments and graduate degrees awarded in the basic or fundamental science fields showed very little growth over the 1970s. In total, degrees awarded and enrolments grew by 2% per year over the period 1972 to 1978 (see Table 30). These trends are in marked contrast to the expansion of the 1960s. For example, graduate degrees in these fields grew at about 15% per year from 1961-62 to 1970-71.

Characteristic features of the basic fundamental sciences are the relatively high "drop-out" rates of those enrolled, the relatively longer time required to obtain a graduate degree and a larger proportion of part-time studies. These features are reflected in the relatively low ratio of degrees awarded to enrolments. In 1977, for example, the ratio of degrees awarded to enrolments was 31% for the basic sciences compared to 41% for all fields. This 1977 ratio has fallen from a level of 35% in 1972, implying that fewer of the students enrolled in the latter part of the 1970s are going on to complete their degrees⁽⁷⁾.

The growth in graduate enrolments and degrees during the 1970s in the applied programs was relatively low. This is quite the opposite observed for undergraduate enrolments and degrees, which rose sharply over this period. Further details on graduate enrolments and degrees in the applied programs are shown in Table 30 and Appendix Table C-4.

(7) For a more detailed discussion see, Social Sciences and Humanities Research Council, "Report of the Commission on Graduate Studies in the Humanities and Social Sciences", Vol. I, Ottawa, 1978.

Education and commerce degrees awarded grew at annual rates of 9% and 11% respectively (from 1972 to 1977). A major reason for the expansion in the education disciplines was the increase in part-time enrolments. The number of business graduates has been increasing due to labour market demand. When education and commerce fields are excluded, graduate degrees in the applied fields category as a whole grew at about 1% per year.

As shown in Table 30, in the applied category, the ratio of degrees awarded to total full-time enrolment was about 55% to 60% throughout the 1970s. In comparison to the basic sciences, this ratio is rather high, and is a function of a lower proportion of part-time students, lower "drop out" rates, and generally a shorter time period required to complete a graduate degree, at least in the case of full-time students.

The factors associated with the trends in the basic and applied fields have been:

- a decreasing growth in the number of undergraduates in the basic and fundamental science fields which has reduced the number of students potentially available to undertake graduate studies in these fields;
- a relatively strong demand and resulting higher salaries for undergraduate degree holders in applied fields, which may have had some influence on the decisions by undergraduates to enter the job market rather than continue their studies in the applied sciences;
- a reduction in the number of new job openings in professions which have traditionally been filled by graduate students, particularly from the fundamental sciences. For example, there were few new job openings for faculty in the universities;
- a gradual reduction in the support of graduate students by both the provinces and the Federal Government. At the provincial level, for example, Ontario has frozen funding for graduate programs at the 1975-76 levels despite enrolment increases.

As well, Ontario graduate bursaries were terminated in 1975-76. At the federal level, the number of graduate students supported by the granting councils decreased at a 7% annual rate over the period 1970-71 to 1976-77;

- an increase in the participation of women in the basic sciences, which partly offset the decrease in male enrolments. For example, in 1972, 26% of the graduates were women. This proportion increased to 33% in 1977. (Based on data in Appendix Tables B-3, B-4 and C-2); and
- a relative increase in the proportion of female degree holders in the applied sciences. For example, the proportion of female graduate degree holders increased from 15% in 1972 to 28% in 1977. (Based on data in Appendix Tables B-3, B-4 and C-4.)

TABLE 11

UNDERGRADUATE FULL-TIME ENROLMENTS, DEGREES AWARDED AND ADJUSTED

SUPPLY IN THE NATURAL SCIENCES¹ 1972-1978

| <u>YEAR</u> | <u>ENROLMENTS</u> | <u>DEGREES AWARDED</u> | <u>ADJUSTED SUPPLY²</u> |
|-------------|-------------------|------------------------|------------------------------------|
| 1972-73 | na | 13156 | 11354 |
| 1973-74 | na | 12905 | 11994 |
| 1974-75 | na | 13551 | 12738 |
| 1975-76 | na | 14136 | 12875 |
| 1976-77 | na | 14806 | 12777 |
| 1977-78 | na | 15668 | 12792 |
| 1978-79 | na | 16589 | na |

NOTES: 1- Natural Sciences include Physical Sciences and Mathematics, Engineering and Applied Sciences and the Life Sciences.

2- Adjusted supply is an estimate by MOSST of the number of recent university graduates who are available for employment. A detailed explanation is contained in Appendix B.

SOURCE: Statistics Canada, "Universities: Enrolment and Degrees", Cat. No. 81-204, Annuals, 1972-73 to 1978 and Appendix 'B'.

TABLE 12

UNDERGRADUATE FULL-TIME ENROLMENTS, DEGREES AWARDED AND ADJUSTEDSUPPLY FOR ENGINEERING¹ & APPLIED SCIENCES 1972-1978

| <u>YEAR</u> | <u>ENROLMENTS</u> | <u>DEGREES AWARDED</u> | <u>ADJUSTED SUPPLY²</u> |
|-------------|-------------------|------------------------|------------------------------------|
| 1972-73 | 21584 | 4449 | 4803 |
| 1973-74 | 21857 | 4426 | 5162 |
| 1974-75 | 24150 | 4494 | 5415 |
| 1975-76 | 26808 | 4325 | 5229 |
| 1976-77 | 29314 | 4595 | 5152 |
| 1977-78 | 31018 | 5042 | 5162 |
| 1978-79 | 32106 | 5758 | na |

NOTES: 1- Excludes Forestry.

2- Adjusted supply is an estimate by MOSST of the number of recent university graduates who are available for employment. A detailed explanation is contained in Appendix B.

SOURCE:

Statistics Canada, "Universities: Enrolment and Degrees", Cat. No. 81-204, Annuals, 1972-73 to 1978 and Appendix 'B'.

TABLE 13
UNDERGRADUATE FULL-TIME ENROLMENTS, DEGREES AWARDED AND ADJUSTED
SUPPLY FOR THE LIFE SCIENCES¹ 1972-1978

| <u>YEAR</u> | <u>ENROLMENTS</u> | <u>DEGREES AWARDED</u> | <u>ADJUSTED SUPPLY²</u> |
|-------------|-------------------|------------------------|------------------------------------|
| 1972-73 | na | 4519 | 3340 |
| 1973-74 | na | 4401 | 3481 |
| 1974-75 | na | 4701 | 3729 |
| 1975-76 | na | 5562 | 4210 |
| 1976-77 | na | 6190 | 4465 |
| 1977-78 | na | 6439 | 4437 |
| 1978-79 | na | 6511 | na |

NOTES: ¹Includes Forestry.

²Adjusted supply is an estimate by MOSST of the number of recent university graduates who are available for employment. A detailed explanation is contained in Appendix B.

SOURCE: Statistics Canada, "Universities: Enrolment and Degrees", Cat. No. 81-204, Annuals, 1972-73 to 1978 and Appendix B.

TABLE 14

UNDERGRADUATE FULL-TIME ENROLMENTS, DEGREES AWARDED AND ADJUSTED
SUPPLY FOR MATH. & PHYSICAL SCIENCES 1972-1978

| <u>YEAR</u> | <u>ENROLMENTS</u> | <u>DEGREES AWARDED</u> | <u>ADJUSTED SUPPLY¹</u> |
|-------------|-------------------|------------------------|------------------------------------|
| 1972-73 | na | 4188 | 3211 |
| 1973-74 | na | 4078 | 3351 |
| 1974-75 | na | 4356 | 3594 |
| 1975-76 | na | 4249 | 3436 |
| 1976-77 | na | 4021 | 3160 |
| 1977-78 | na | 4187 | 3193 |
| 1978-79 | na | 4320 | na |

NOTE: ¹Adjusted supply is an estimate by MOSST of the number of recent university graduates who are available for employment. A detailed explanation is contained in Appendix B.

SOURCE: Statistics Canada, "Universities: Enrolment and Degrees" Cat. No 81-204, Annuals, 1972-73 to 1978 and Appendix B.

TABLE 15

UNDERGRADUATE FULL-TIME ENROLMENTS, DEGREES AWARDED AND ADJUSTED
SUPPLY FOR THE HUMANITIES & FINE ARTS 1972-1978

| <u>YEAR</u> | <u>ENROLMENTS</u> | <u>DEGREES AWARDED</u> | <u>ADJUSTED SUPPLY¹</u> |
|-------------|-------------------|------------------------|------------------------------------|
| 1972-73 | na | 11157 | 8385 |
| 1973-74 | na | 10865 | 8512 |
| 1974-75 | na | 11604 | 9147 |
| 1975-76 | na | 12151 | 9205 |
| 1976-77 | na | 12042 | 8983 |
| 1977-78 | na | 12757 | 9303 |
| 1978-79 | na | 12704 | na |

NOTE: ¹Adjusted supply is an estimate by MOSST of the number of recent university graduates who are available for employment. A detailed explanation is contained in Appendix B.

SOURCE: Statistics Canada, "Universities: Enrolment and Degrees", Cat. No. 81-204, Annuals, 1972-73 to 1978 and Appendix B.

TABLE 16
UNDERGRADUATE FULL-TIME ENROLMENTS, DEGREES AWARDED AND ADJUSTED
SUPPLY FOR THE HEALTH FIELDS 1972-1978

| <u>YEAR</u> | <u>ENROLMENTS</u> | <u>DEGREES AWARDED</u> | <u>ADJUSTED SUPPLY¹</u> |
|-------------|-------------------|------------------------|------------------------------------|
| 1972-73 | 17148 | 3854 | 4824 |
| 1973-74 | 18298 | 4007 | 5323 |
| 1974-75 | 18969 | 4991 | 6259 |
| 1975-76 | 19818 | 5138 | 6118 |
| 1976-77 | 20607 | 5492 | 5960 |
| 1977-78 | 20533 | 5698 | 5959 |
| 1978-79 | 20608 | 5669 | na |

NOTE: ¹Adjusted supply is an estimate by MOSST of the number of recent university graduates who are available for employment. A detailed explanation is contained in Appendix B.

SOURCE: Statistics Canada, "Universities: Enrolment and Degrees", Cat. No. 81-204, Annuals, 1972-73 to 1978 and Appendix B.

TABLE 17
UNDERGRADUATE FULL-TIME ENROLMENTS, DEGREES AWARDED AND ADJUSTED
SUPPLY IN EDUCATION 1972-1978

| <u>YEAR</u> | <u>ENROLMENTS</u> | <u>DEGREES AWARDED</u> | <u>ADJUSTED SUPPLY¹</u> |
|-------------|-------------------|------------------------|------------------------------------|
| 1972-73 | 33319 | 16019 | 14531 |
| 1973-74 | 33768 | 15285 | 13935 |
| 1974-75 | 35906 | 15332 | 14300 |
| 1975-76 | 41748 | 18420 | 16903 |
| 1976-77 | 43791 | 19604 | 18096 |
| 1977-78 | 42218 | 19853 | 18099 |
| 1978-79 | 38464 | 19514 | na |

NOTE: ¹Adjusted supply is an estimate by MOSST of the number of recent university graduates who are available for employment. A detailed explanation is contained in Appendix B.

SOURCE: Statistics Canada, "Universities: Enrolment and Degrees", Cat. No. 81-204, Annuals, 1972-73 to 1978 and Appendix B.

TABLE 18
UNDERGRADUATE FULL-TIME ENROLMENTS, DEGREES AWARDED AND ADJUSTED
SUPPLY IN SOCIAL SCIENCES¹ 1972-1978

| <u>YEAR</u> | <u>ENROLMENTS</u> | <u>DEGREES AWARDED</u> | <u>ADJUSTED SUPPLY²</u> |
|-------------|-------------------|------------------------|------------------------------------|
| 1972-73 | na | 14549 | 10000 |
| 1973-74 | na | 13591 | 9893 |
| 1974-75 | na | 13562 | 9832 |
| 1975-76 | na | 14522 | 10068 |
| 1976-77 | na | 14467 | 10152 |
| 1977-78 | na | 15727 | 10732 |
| 1978-79 | na | 16157 | na |

NOTES: ¹Excludes Law and Commerce.

²Adjusted supply is an estimate by MOSST of the number of recent university graduates who are available for employment. A detailed explanation is contained in Appendix B.

SOURCE: Statistics Canada, "Universities: Enrolment and Degrees", Cat. No. 81-204, Annuals, 1972-73 to 1978 and Appendix B.

TABLE 19
UNDERGRADUATE FULL-TIME ENROLMENTS, DEGREES AWARDED AND ADJUSTED
SUPPLY IN LAW & COMMERCE 1972-1978

| <u>YEAR</u> | <u>ENROLMENTS</u> | <u>DEGREES AWARDED</u> | <u>ADJUSTED SUPPLY¹</u> |
|-------------|-------------------|------------------------|------------------------------------|
| 1972-73 | 26076 | 5808 | 5297 |
| 1973-74 | 29189 | 6233 | 5844 |
| 1974-75 | 32083 | 7634 | 7097 |
| 1975-76 | 35658 | 8335 | 7352 |
| 1976-77 | 38043 | 9081 | 8302 |
| 1977-78 | 39632 | 10004 | 8766 |
| 1978-79 | 42350 | 10879 | na |

NOTE: ¹Adjusted supply is an estimate by MOSST of the number of recent university graduates who are available for employment. A detailed explanation is contained in Appendix B.

SOURCE: Statistics Canada, "Universities: Enrolment and Degrees", Cat. No. 81-204, Annuals, 1972-73 to 1978 and Appendix B.

TABLE 20

FULL-TIME BACHELOR AND FIRST PROFESSIONAL ENROLMENTS AND DEGREES AWARDED 1972-1978

| <u>Enrolments</u> | <u>1972</u> | <u>1973</u> | <u>1974</u> | <u>1975</u> | <u>1976</u> | <u>1977</u> | <u>1978</u> |
|----------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| General Arts and Sc. Programs | 157415 | 164773 | 172440 | 178275 | 178502 | 174668 | 168084 |
| Applied Programs | 101293 | 106370 | 114888 | 127891 | 135401 | 137188 | 137463 |
| TOTAL ¹ | 259203 | 271675 | 288006 | 307657 | 315272 | 312623 | 306794 |

Degrees Awarded²

| | | | | | | | |
|----------------------------------|-------|-------|-------|-------|-------|-------|-------|
| General Arts and Sc. Programs | 41313 | 39469 | 41031 | 42339 | 42678 | 44719 | 46098 |
| Applied Programs | 31250 | 31227 | 33961 | 37680 | 40598 | 42376 | 43184 |
| TOTAL | 72563 | 70696 | 74992 | 80019 | 83276 | 87095 | 89282 |

NOTES: ¹Included in total enrolments are the "other and not reported" categories.

²Computer Science is included in general arts and science programs for 1978 while for all other years it is included in applied programs.

SOURCE: Statistics Canada, "Universities: Enrolment and Degrees", Cat. No. 81-204, Annuals, 1972-73 to 1978.

TABLE 21

GRADUATE FULL-TIME ENROLMENTS, DEGREES AWARDED AND ADJUSTED SUPPLY
IN THE NATURAL SCIENCES¹ 1972-1978

| YEAR | ENROLMENTS | | | DEGREES AWARDED | | | ADJUSTED SUPPLY ² | | |
|---------|------------|------|-------|-----------------|------|-------|------------------------------|------|-------|
| | MA | PhD | TOTAL | MA | PhD | TOTAL | MA | PhD | TOTAL |
| | | | | | | | | | |
| 1972-73 | 5046 | 4280 | 9326 | 2537 | 1025 | 3562 | 2479 | 1322 | 3801 |
| 1973-74 | 5178 | 3890 | 9068 | 2409 | 1106 | 3515 | 2437 | 1460 | 3897 |
| 1974-75 | 5441 | 3594 | 9035 | 2197 | 1022 | 3219 | 2232 | 1382 | 3614 |
| 1975-76 | 6203 | 3633 | 9836 | 2216 | 879 | 3095 | 2122 | 1151 | 3273 |
| 1976-77 | 6447 | 3702 | 10149 | 2468 | 766 | 3234 | 2166 | 925 | 3091 |
| 1977-78 | 6255 | 3594 | 9849 | 2699 | 800 | 3499 | 2238 | 913 | 3151 |
| 1978-79 | 5995 | 3423 | 9418 | 2661 | 848 | 3509 | na | na | na |

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NOTES: ¹Natural Sciences = Math. and Physical Sc., Engineering, Architecture and Life Sciences.

²Adjusted supply is an estimate by MOSST of the number of recent university graduates who are available for employment. A detailed explanation is contained in Appendix B.

SOURCE: Statistics Canada, "Universities: Enrolment and Degrees", Cat. No. 81-204, Annuals, 1972-73 to 1978 and Appendix B.

TABLE 22

GRADUATE FULL-TIME ENROLMENTS, DEGREES AWARDED AND ADJUSTED SUPPLY
FOR ENGINEERING¹ & APPLIED SCIENCES 1972-78

| YEAR | ENROLMENTS | | | DEGREES AWARDED | | | ADJUSTED SUPPLY ² | | |
|---------|------------|------|-------|-----------------|-----|-------|------------------------------|-----|-------|
| | MA | PhD | TOTAL | MA | PhD | TOTAL | MA | PhD | TOTAL |
| 1972-73 | 1955 | 1178 | 3133 | 987 | 258 | 1245 | 1011 | 316 | 1327 |
| 1973-74 | 1955 | 1047 | 3002 | 973 | 290 | 1263 | 1017 | 351 | 1368 |
| 1974-75 | 2174 | 986 | 3160 | 902 | 295 | 1197 | 940 | 371 | 1311 |
| 1975-76 | 2431 | 971 | 3402 | 857 | 209 | 1066 | 877 | 272 | 1149 |
| 1976-77 | 2357 | 978 | 3335 | 991 | 181 | 1172 | 910 | 224 | 1134 |
| 1977-78 | 2383 | 950 | 3333 | 1097 | 198 | 1295 | 912 | 227 | 1139 |
| 1978-79 | 2194 | 852 | 3046 | 1102 | 218 | 1320 | na | na | na |

NOTES: ¹Excludes Forestry.

²Adjusted supply is an estimate by MOSST of the number of recent university graduates who are available for employment. A detailed explanation is contained in Appendix B.

SOURCE: Statistics Canada, "Universities: Enrolment and Degrees", Cat. No. 81-204, Annuals, 1972-73 to 1978 and Appendix B.

TABLE 23

GRADUATE FULL-TIME ENROLMENTS, DEGREES AWARDED AND ADJUSTED
SUPPLY FOR THE LIFE SCIENCES¹ 1972-1978

| <u>YEAR</u> | <u>ENROLMENTS</u> | | | <u>DEGREES AWARDED</u> | | | <u>ADJUSTED SUPPLY²</u> | | |
|-------------|-------------------|------------|--------------|------------------------|------------|--------------|------------------------------------|------------|--------------|
| | <u>MA</u> | <u>PhD</u> | <u>TOTAL</u> | <u>MA</u> | <u>PhD</u> | <u>TOTAL</u> | <u>MA</u> | <u>PhD</u> | <u>TOTAL</u> |
| 1972-73 | 1144 | 945 | 2089 | 583 | 243 | 826 | 599 | 323 | 922 |
| 1973-74 | 1299 | 933 | 2232 | 511 | 259 | 770 | 546 | 351 | 897 |
| 1974-75 | 1283 | 863 | 2146 | 477 | 253 | 730 | 515 | 336 | 851 |
| 1975-76 | 1611 | 924 | 2535 | 531 | 247 | 778 | 530 | 315 | 845 |
| 1976-77 | 1915 | 981 | 2896 | 618 | 207 | 825 | 570 | 250 | 820 |
| 1977-78 | 1889 | 974 | 2863 | 674 | 233 | 907 | 606 | 262 | 868 |
| 1978-79 | 1901 | 985 | 2886 | 682 | 245 | 927 | na | na | na |

NOTES: ¹Includes Forestry

²Adjusted supply is an estimate by MOSST of the number of recent university graduates who are available for employment. A detailed explanation is contained in Appendix B.

SOURCE: Statistics Canada, "Universities: Enrolment and Degrees", Cat. No. 81-204, Annuals, 1972-73 to 1978 and Appendix B.

TABLE 24
GRADUATE FULL-TIME ENROLMENTS, DEGREES AWARDED AND ADJUSTED SUPPLY
IN MATH. & PHYSICAL SCIENCES, 1972-1978

| YEAR | ENROLMENTS | | | DEGREES AWARDED | | | ADJUSTED SUPPLY ¹ | | |
|---------|------------|------|-------|-----------------|-----|-------|------------------------------|-----|-------|
| | MA | PhD | TOTAL | MA | PhD | TOTAL | MA | PhD | TOTAL |
| | | | | | | | | | |
| 1972-73 | 1947 | 2157 | 4104 | 957 | 524 | 1481 | 869 | 683 | 1552 |
| 1973-74 | 1924 | 1910 | 3834 | 925 | 557 | 1482 | 874 | 758 | 1632 |
| 1974-75 | 1984 | 1745 | 3729 | 821 | 478 | 1299 | 777 | 675 | 1452 |
| 1975-76 | 2161 | 1738 | 3899 | 831 | 425 | 1256 | 715 | 564 | 1279 |
| 1976-77 | 2175 | 1743 | 3918 | 864 | 381 | 1245 | 686 | 451 | 1137 |
| 1977-78 | 1983 | 1670 | 3653 | 935 | 375 | 1310 | 720 | 424 | 1144 |
| 1978-79 | 1900 | 1586 | 3486 | 877 | 385 | 1262 | na | na | na |

NOTE: ¹Adjusted supply is an estimate by MOSST of the number of recent university graduates who are available for employment. A detailed explanation is contained in Appendix B.

SOURCE: Statistics Canada, "Universities: Enrolment and Degrees", Cat. No. 81-204, Annuals, 1972-73 to 1978 and Appendix B.

TABLE 25

GRADUATE FULL-TIME ENROLMENTS, DEGREES AWARDED AND ADJUSTED
SUPPLY FOR THE HUMANITIES & FINE ARTS 1972-1978

| YEAR | ENROLMENTS | | | DEGREES AWARDED | | | ADJUSTED SUPPLY ¹ | | |
|---------|------------|------|-------|-----------------|-----|-------|------------------------------|-----|-------|
| | MA | PhD | TOTAL | MA | PhD | TOTAL | MA | PhD | TOTAL |
| | | | | | | | | | |
| 1972-73 | 4477 | 2108 | 6585 | 2359 | 208 | 2567 | 2182 | 262 | 2444 |
| 1973-74 | 4405 | 1990 | 6395 | 2366 | 233 | 2599 | 2331 | 304 | 2635 |
| 1974-75 | 4811 | 2044 | 6855 | 2116 | 268 | 2384 | 2122 | 321 | 2443 |
| 1975-76 | 4883 | 2000 | 6883 | 2211 | 301 | 2512 | 2191 | 351 | 2542 |
| 1976-77 | 4975 | 2054 | 7029 | 2075 | 253 | 2328 | 2065 | 274 | 2339 |
| 1977-78 | 5310 | 2022 | 7332 | 2175 | 267 | 2442 | 2116 | 289 | 2405 |
| 1978-79 | 5323 | 1905 | 7228 | 2198 | 266 | 2464 | na | na | na |

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NOTE: ¹Adjusted supply is an estimate by MOSST of the number of recent university graduates who are available for employment. A detailed explanation is contained in Appendix B.

SOURCE: Statistics Canada, "Universities: Enrolment and Degrees", Cat. No. 81-204, Annuals, 1972-73 to 1978 and Appendix B.

TABLE 26

GRADUATE FULL-TIME ENROLMENTS, DEGREES AWARDED AND ADJUSTED
SUPPLY FOR THE HEALTH FIELDS 1972-1978

| YEAR | ENROLMENTS | | | DEGREES AWARDED | | | ADJUSTED SUPPLY ¹ | | |
|---------|------------|-----|-------|-----------------|-----|-------|------------------------------|-----|-------|
| | MA | PhD | TOTAL | MA | PhD | TOTAL | MA | PhD | TOTAL |
| 1972-73 | 568 | 527 | 1095 | 313 | 151 | 464 | 382 | 158 | 540 |
| 1973-74 | 684 | 470 | 1154 | 343 | 178 | 521 | 421 | 183 | 604 |
| 1974-75 | 866 | 435 | 1301 | 305 | 153 | 458 | 396 | 161 | 557 |
| 1975-76 | 923 | 478 | 1401 | 382 | 122 | 504 | 444 | 125 | 569 |
| 1976-77 | 1008 | 474 | 1482 | 398 | 105 | 503 | 401 | 104 | 505 |
| 1977-78 | 1035 | 506 | 1541 | 436 | 105 | 541 | 414 | 101 | 515 |
| 1978-79 | 1207 | 591 | 1798 | 517 | 125 | 642 | na | na | na |

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NOTE: ¹Adjusted supply is an estimate by MOSST of the number of recent university graduates who are available for employment. A detailed explanation is contained in Appendix B.

SOURCE: Statistics Canada, "Universities: Enrolment and Degrees", Cat. No. 81-204, Annuals, 1972-73 to 1978 and Appendix B.

TABLE 27

GRADUATE FULL-TIME ENROLMENTS, DEGREES AWARDED AND ADJUSTED

SUPPLY IN EDUCATION 1972-1978

| YEAR | ENROLMENTS | | | DEGREES AWARDED | | | ADJUSTED SUPPLY ¹ | | |
|---------|------------|-----|-------|-----------------|-----|-------|------------------------------|-----|-------|
| | MA | PhD | TOTAL | MA | PhD | TOTAL | MA | PhD | TOTAL |
| 1972-73 | 1893 | 654 | 2547 | 1721 | 109 | 1830 | 1069 | 88 | 1157 |
| 1973-74 | 2095 | 659 | 2754 | 1952 | 122 | 2074 | 1109 | 89 | 1198 |
| 1974-75 | 2049 | 679 | 2728 | 1992 | 128 | 2120 | 1032 | 101 | 1133 |
| 1975-76 | 2472 | 722 | 3194 | 2161 | 155 | 2316 | 1074 | 123 | 1197 |
| 1976-77 | 2635 | 748 | 3383 | 2354 | 157 | 2511 | 1109 | 107 | 1216 |
| 1977-78 | 2683 | 759 | 3442 | 2594 | 173 | 2767 | 1224 | 111 | 1335 |
| 1978-79 | 2600 | 834 | 3434 | 2825 | 157 | 2982 | na | na | na |

NOTE: ¹Adjusted supply is an estimate by MOSST of the number of recent university graduates who are available for employment. A detailed explanation is contained in Appendix B.

SOURCE: Statistics Canada, "Universities: Enrolment and Degrees", Cat. No. 81-204, Annuals, 1972-73 to 1978 and Appendix B.

TABLE 28

GRADUATE FULL-TIME ENROLMENTS, DEGREES AWARDED AND ADJUSTED

SUPPLY IN SOCIAL SCIENCES¹ 1972-1978

| YEAR | ENROLMENTS | | | DEGREES AWARDED | | | ADJUSTED SUPPLY ² | | |
|---------|------------|------|-------|-----------------|-----|-------|------------------------------|-----|-------|
| | MA | PhD | TOTAL | MA | PhD | TOTAL | MA | PhD | TOTAL |
| 1972-73 | 4792 | 2087 | 6879 | 2196 | 215 | 2411 | 2089 | 269 | 2358 |
| 1973-74 | 5082 | 2189 | 7271 | 2314 | 275 | 2589 | 2177 | 336 | 2513 |
| 1974-75 | 5409 | 2249 | 7658 | 2306 | 311 | 2617 | 2030 | 359 | 2389 |
| 1975-76 | 5781 | 2366 | 8147 | 2434 | 346 | 2780 | 2089 | 360 | 2449 |
| 1976-77 | 6018 | 2580 | 8598 | 2583 | 389 | 2972 | 2230 | 363 | 2593 |
| 1977-78 | 6139 | 2609 | 8748 | 2600 | 342 | 2942 | 2048 | 319 | 2367 |
| 1978-79 | 6167 | 2582 | 8749 | 2718 | 400 | 3118 | na | na | na |

NOTES: ¹Excludes Law and Commerce.

²Adjusted supply is an estimate by MOSST of the number of recent university graduates who are available for employment. A detailed explanation is contained in Appendix B.

SOURCE: Statistics Canada, "Universities: Enrolment and Degrees", Cat. No. 81-204, Annuals, 1972-73 to 1978 and Appendix B.

TABLE 29

GRADUATE FULL-TIME ENROLMENTS, DEGREES AWARDED AND ADJUSTED SUPPLY
IN LAW AND COMMERCE 1972-1978

| YEAR | ENROLMENTS | | DEGREES AWARDED | | ADJUSTED SUPPLY 1 | | | | |
|---------|------------|-----|-----------------|------|-------------------|-------|------|----|------|
| | MA | PhD | TOTAL | MA | PhD | TOTAL | | | |
| 1972-73 | 2315 | 118 | 2433 | 1163 | 16 | 1179 | 1201 | 19 | 1220 |
| 1973-74 | 2542 | 97 | 2639 | 1269 | 15 | 1284 | 1348 | 24 | 1372 |
| 1974-75 | 2756 | 108 | 2864 | 1323 | 14 | 1337 | 1555 | 21 | 1576 |
| 1975-76 | 2988 | 132 | 3120 | 1678 | 26 | 1704 | 1669 | 32 | 1701 |
| 1976-77 | 2940 | 120 | 3060 | 1753 | 21 | 1774 | 1637 | 27 | 1664 |
| 1977-78 | 3121 | 141 | 3262 | 1947 | 15 | 1962 | 1873 | 21 | 1894 |
| 1978-79 | 3229 | 164 | 3393 | 1811 | 23 | 1834 | na | na | na |

NOTE: ¹Adjusted supply is an estimate by MOSST of the number of recent university graduates who are available for employment. A detailed explanation is contained in Appendix B.

SOURCE: Statistics Canada, "Universities: Enrolment and Degrees", Cat. No. 81-204, Annuals, 1972-73 to 1978 and Appendix B.

TABLE 30

FULL-TIME GRADUATE ENROLMENTS AND DEGREES AWARDED 1972-1978

| <u>Enrolments</u> | <u>1972</u> | <u>1973</u> | <u>1974</u> | <u>1975</u> | <u>1976</u> | <u>1977</u> | <u>1978</u> |
|------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Basic Sciences | 18943 | 18988 | 19748 | 20807 | 21762 | 21816 | 21461 |
| Applied Sciences | 9922 | 10293 | 10693 | 11774 | 11939 | 12358 | 12559 |
| TOTAL ¹ | 29327 | 29540 | 31296 | 33175 | 33865 | 34398 | 34275 |
| <u>Degrees Awarded</u> | | | | | | | |
| Basic Sciences | 6572 | 6822 | 6236 | 6605 | 6722 | 6778 | 7324 |
| Applied Sciences | 5420 | 5737 | 5856 | 6133 | 6523 | 7303 | 7132 |
| TOTAL | 11992 | 12559 | 12092 | 12738 | 13245 | 14081 | 14456 |

NOTE: ¹Total enrolments include unreported specializations.

SOURCE: Statistics Canada, "Universities: Enrolment and Degrees",
Cat. No. 81-204, Annuals, 1972-73 to 1978 and Appendix B.

III REGIONAL TRENDS

From 1974 to 1978, the number of undergraduate degrees awarded in the human, natural and health sciences for Canada as a whole rose from 74,851 to 89,282, or by 4.5% per annum. The Quebec growth rate was 7% per annum followed by 6% in Ontario, 3% in the Western provinces, and a decline in the Atlantic provinces.

In the Atlantic provinces the decrease in the number of undergraduate degrees was due to a decrease in participation rates. The growth in degrees awarded in the Western provinces was due mainly to the growth in the population base and in Ontario and Quebec degrees awarded grew mainly as a result of increased participation rates.

In the human sciences⁽⁸⁾, Quebec and Ontario accounted for 67% of total undergraduate degrees in 1978, an increase from 62% in 1974. The number of degrees in the human sciences from the Atlantic region actually decreased, while the number of degrees from the Western provinces increased slightly from 1974 to 1978, barely maintaining the share in the total.

In the natural sciences⁽⁹⁾, the proportion of undergraduate degrees from Quebec increased from 20% of the national total in 1974 to 23% in 1978. Ontario also increased its share slightly from 41% to 42% of the total. The share of graduates from the Western provinces decreased (28% to 25%), as did the share from the Atlantic region (12% to 10%).

In the health sciences in 1978, Quebec produced the largest number of undergraduate degrees awarded (32%), followed by Ontario (31%), the Western provinces (28%), and the Atlantic provinces (9%). Compared with 1974, the Western provinces' share rose from 26% and the Atlantic provinces' share fell from 12%.

(8) Human sciences refers to the social sciences and humanities including education and law.

(9) The natural sciences are defined to include the physical sciences and mathematics, the life sciences and engineering.

The number of undergraduate degrees awarded in the four regions for the years 1974 to 1978 are given in Table 31 below.

Regarding graduate degrees awarded in the human, natural and health sciences in 1978, half the degrees were given in Ontario (50%), followed by Quebec (24%), the Western provinces (20%) and the Atlantic region (6%).

In the Atlantic provinces, graduate degrees awarded in these fields grew by 6% per year from 1971 to 1978, and the growth was mainly due to an increase in the population base rather than changes in participation rates. Graduate degrees awarded in Quebec also increased by 6% per year over this period, but the increase was due to a combination of increased participation rates and growth in the population base. In Ontario and the Western provinces the number of degrees awarded increased by only 3% and 1% per annum respectively, and participation rates in these regions declined over this period.

In the human sciences, over half (52%) of the graduates came from Ontario, in 1978 (compared with 55% in 1971), 23% came from Quebec (increasing from 20% in 1971); 18% from the Western provinces; and 7% from the Atlantic.

In the natural sciences, the total number of graduate degrees awarded declined from 3705 in 1971 to 3509 in 1978. The low point in the decline was 1975, and some of the lost ground has since been recovered. Only in Quebec was the 1971 level of graduates in the natural sciences exceeded in 1978, raising its share in the total to 25%. Ontario's share in 1978 was 45%, the West's 25%, and the Atlantic provinces' 5%.

The number of total health science graduates rose from 379 in 1971 to 549 in 1978. The bulk of the increases took place in Quebec and Ontario, in about equal terms. The number of graduates from Western universities in this field remained at about the same level over these years, around 100. There were 37 graduates in the Atlantic provinces in 1978.

More details on graduate degrees in the natural, health and human sciences in the various regions for the years 1971 to 1978 are given in Table 32.

BACHELOR AND FIRST PROFESSIONAL DEGREES AWARDED FOR THE HUMAN,
NATURAL AND HEALTH SCIENCES BY REGION AT CANADIAN UNIVERSITIES,

SCIENCE

REGION

1974

1975

1976

1977

1978

Atlantic
Quebec
Ontario
Western
CANADA

6076
12177
23404
11764
53421

6249
11644
25087
12214
55194

6098
13388
26000
12778
58264

6163
14563
25187
13341
59254

Atlantic
Quebec
Ontario
Western
CANADA

1572
3254
6032
3616
14474

1584
3176
6246
3800
14806

1582
3760
6482
3841
15665

1585
3886
6959
4159
16589

Atlantic
Quebec
Ontario
Western
CANADA

523
1615
1598
1401
5137

482
1819
1726
1464
5491

505
1879
1768
1545
5697

520
1795
1739
1615
5669

Atlantic
Quebec
Ontario
Western
CANADA

546
96
5479
1584
7705

535
189
5852
1209
7785

379
231
6028
1092
7730

307
425
5829
1209
7770

Atlantic
Quebec
Ontario
Western
CANADA

8717
17142
36513
18365
80737

8850
16828
38911
18687
83276

8564
19258
40278
19256
87356

8575
20669
39714
20324
89282

Statistics Canada, "Degrees, Diplomas and Certificates Awarded by Universities", Cat. No. 81-211, Annuals, 1974 and 1975 and "Universities: Enrolment and Degrees", Cat. No. 81-204, Annuals, 1976-1978, Education Science and Culture Division, Ottawa.

TABLE 32
GRADUATE DEGREES AWARDED BY SCIENCE AND REGION AT CANADIAN UNIVERSITIES,
1971-1978

| SCIENCE | REGION | 1971 | 1972 | 1973 | 1974 | 1975 | 1976 | 1977 | 1978 |
|-------------|----------|-------|-------|-------|-------|-------|-------|-------|-------|
| Human Sc. | Atlantic | 345 | 369 | 469 | 461 | 500 | 518 | 641 | 691 |
| | Quebec | 1443 | 1451 | 1765 | 1787 | 2028 | 2035 | 2164 | 2423 |
| | Ontario | 3919 | 4418 | 4600 | 4576 | 5058 | 5232 | 5432 | 5366 |
| | Western | 1472 | 1749 | 1712 | 1634 | 1725 | 1800 | 1874 | 1918 |
| | CANADA | 7179 | 7987 | 8546 | 8458 | 9311 | 9585 | 10111 | 10398 |
| Natural Sc. | Atlantic | 253 | 233 | 208 | 215 | 188 | 200 | 183 | 189 |
| | Quebec | 761 | 564 | 684 | 649 | 692 | 647 | 792 | 866 |
| | Ontario | 1648 | 1745 | 1581 | 1497 | 1548 | 1569 | 1677 | 1578 |
| | Western | 1043 | 1010 | 1042 | 858 | 744 | 821 | 846 | 876 |
| | CANADA | 3705 | 3552 | 3515 | 3219 | 3172 | 3237 | 3498 | 3509 |
| Health Sc. | Atlantic | 9 | 11 | 19 | 7 | 6 | 16 | 9 | 37 |
| | Quebec | 138 | 144 | 198 | 177 | 148 | 163 | 196 | 202 |
| | Ontario | 138 | 176 | 179 | 142 | 160 | 165 | 181 | 212 |
| | Western | 94 | 112 | 102 | 89 | 111 | 82 | 82 | 98 |
| | CANADA | 379 | 443 | 498 | 415 | 425 | 426 | 468 | 549 |
| TOTAL SC. | Atlantic | 607 | 613 | 696 | 683 | 694 | 734 | 833 | 917 |
| | Quebec | 2342 | 2159 | 2647 | 2613 | 2868 | 2845 | 3152 | 3491 |
| | Ontario | 5705 | 6339 | 6360 | 6215 | 6766 | 6966 | 7290 | 7156 |
| | Western | 2609 | 2871 | 2856 | 2581 | 2580 | 2703 | 2802 | 2892 |
| | CANADA | 11263 | 11982 | 12559 | 12092 | 12908 | 13248 | 14077 | 14456 |

SOURCE: Statistics Canada, "Universities: Enrolment and Degrees", Cat. No. 81-204, Annuals, 1971-1978, Education, Science and Culture Division, Ottawa.

IV TRENDS IN ENROLMENT BY UNIVERSITY

In 1972 and 1977, 78% of full-time enrolments at the first degree level were concentrated in 20 universities, with the remaining 28 universities accounting for the remainder. With few exceptions, the concentration of enrolments in the various large universities did not change over this period. By 1977, Memorial and Dalhousie were replaced by Concordia and Windsor in the group of 20 largest universities. More details are provided in Table 33 below.

Full-time enrolments at the graduate level at selected universities are shown in Table 34. Twenty universities accounted for about 89% of graduate enrolments, and this proportion did not change between 1971 and 1977. With few exceptions, the universities with the largest undergraduate enrolments also accounted for the largest graduate enrolments.

TABLE 33
FULL-TIME ENROLMENTS AT THE BACHELOR AND FIRST PROFESSIONAL
LEVEL AT SELECTED CANADIAN UNIVERSITIES BY REGION 1972-1977

| REGION | 1972 | | | 1977 | | |
|-----------------------|--------------------------|--------------|---------|----------------|--------------|---------|
| | UNIVERSITY | NO. ENROLLED | PERCENT | UNIVERSITY | NO. ENROLLED | PERCENT |
| ATLANTIC | - Memorial ¹ | 6740 | | | | |
| | - Dalhousie ¹ | 4957 | | | | |
| | | 11697 | 4.73 | | | |
| QUEBEC | - Montreal | 9898 | | - Laval | 14315 | |
| | - Laval | 8596 | | - McGill | 11811 | |
| | - Quebec | 8192 | | - Quebec | 11608 | |
| | - McGill | 8159 | | - Montreal | 10653 | |
| | | | | - Concordia | 8762 | |
| | | 34845 | 14.09 | | 57149 | 19.28 |
| ONTARIO | - Toronto | 21638 | | - Toronto | 25028 | |
| | - Waterloo | 11436 | | - Western | 13239 | |
| | - Western | 10862 | | - Waterloo | 13154 | |
| | - York | 9853 | | - York | 10995 | |
| | - Queen's | 7679 | | - Ottawa | 9093 | |
| | - Carleton | 7085 | | - Queen's | 9001 | |
| | - Guelph | 6937 | | - Guelph | 8996 | |
| | - McMaster | 6920 | | - McMaster | 8710 | |
| | - Ottawa | 6738 | | - Carleton | 7444 | |
| | | | | - Windsor | 5980 | |
| | | 89148 | 36.06 | | 111640 | 37.67 |
| WEST | - U.B.C. | 14956 | | - U.B.C. | 16816 | |
| | - Alberta | 14667 | | - Alberta | 16483 | |
| | - Manitoba | 10611 | | - Manitoba | 10686 | |
| | - Saskatchewan | 8092 | | - Calgary | 9494 | |
| | - Calgary | 7735 | | - Saskatchewan | 8964 | |
| | | 56061 | 22.67 | | 62443 | 21.07 |
| TOTAL 20 Universities | | 191751 | 77.56 | | 231232 | 78.02 |
| TOTAL 48 Universities | | 247244 | 100.00 | | 296383 | 100.00 |

NOTE: In 1977, the number enrolled at Memorial University was 4525 and Dalsousie, 5441.

SOURCE: Statistics Canada, "Universities: Enrolment and Degrees", Cat. No. 81-204, 1977
and "Fall Enrolment in Universities", Cat. No. 81-204, 1972-73 and 1973-74.

TABLE 34

FULL-TIME ENROLMENTS AT THE MASTERS AND PHD LEVELS AT SELECTED
CANADIAN UNIVERSITIES BY REGION 1972-1977

| REGION | UNIVERSITY | 1972 NO. ENROLLED | PERCENT | UNIVERSITY | 1977 NO. ENROLLED | PERCENT |
|-----------------------|----------------|----------------------|---------|----------------|----------------------|---------|
| ATLANTIC | - Dalhousie | 698 | | - Dalhousie | 931 | |
| | | 698 | 2.46 | | 931 | 2.80 |
| QUEBEC | - McGill | 2326 | | - McGill | 3066 | |
| | - Montreal | 1574 | | - Montreal | 1766 | |
| | - Laval | 1203 | | - Laval | 1613 | |
| | - Sherbrooke | 708 | | - Sherbrooke | 1158 | |
| | | | | - Quebec | 866 | |
| | | | | - Concordia | 659 | |
| | | 5311 | 20.44 | | 9128 | 27.41 |
| ONTARIO | - Toronto | 3699 | | - Toronto | 4387 | |
| | - Western | 1398 | | - Western | 1618 | |
| | - McMaster | 1171 | | - York | 1203 | |
| | - Waterloo | 1136 | | - Waterloo | 1184 | |
| | - Ottawa | 1044 | | - McMaster | 1126 | |
| | - York | 900 | | - Ottawa | 1112 | |
| | - Queen's | 888 | | - Queen's | 1112 | |
| | - Carleton | 577 | | - Carleton | 896 | |
| | - Guelph | 487 | | | | |
| | | 11300 | 39.75 | | 12638 | 37.95 |
| WESTERN | - U.B.C. | 2553 | | - U.B.C. | 2077 | |
| | - Alberta | 1853 | | - Alberta | 1840 | |
| | - Manitoba | 1066 | | - Manitoba | 1242 | |
| | - Simon Fraser | 789 | | - Calgary | 914 | |
| | - Calgary | 781 | | - Simon Fraser | 659 | |
| | - Saskatchewan | 461 | | | | |
| | | 7503 | 26.39 | | 6732 | 20.22 |
| TOTAL 20 Universities | | 25312 | 89.03 | | 29429 | 88.38 |
| TOTAL 48 Universities | | 28431 | 100.00 | | 33298 | 100.00 |

SOURCE: Statistics Canada, "Universities: Enrolment and Degrees", Cat. No. 81-204, 1977
and "Fall Enrolment in Universities", Cat. No. 81-204, 1972-73 and 1973-74.

APPENDIX A

A Technical Note on the Methodology used to
Calculate Participation Rate Indices

APPENDIX A

A TECHNICAL NOTE ON THE METHODOLOGY USED TO CALCULATE PARTICIPATION RATE INDICES

Traditionally, participation rates are defined as the ratio of enrolment to population, for a given aggregate, such as total full-time undergraduate enrolment as a percentage of the 18-21 population. Published data also provide such aggregate rates by sex.

However, such synthetic rates mask two factors that could offset the movement in aggregate participation rates:

- the actual university enrolment consists not only of persons in a specified age group such as 18-21, or 18-24, but contains some younger, and certainly many older persons. Further, the proportions of the under and over-aged persons are not constant over time; and
- the under and over-aged proportions vary significantly from one category of enrolment to the next, and also by sex. For example, distribution by single-year of age for undergraduate full-time male students is significantly different from that of part-time graduate females, etc. (Eight categories of enrolment with reasonably homogeneous distributions have been identified in another MOSST paper - see "University Enrolment Projections to 2000", p. 14.)

In computing participation rates, therefore, it is necessary to remove the distorting effects of changes in the various age distributions. The approach proposed here is to express participation changes in terms of rates for single-year age groups within each category of enrolment; and in terms of indices for aggregate categories of enrolment. (The categories of enrolment are undergraduate full-time male, graduate part-time female, etc.) The indices proposed here express the changes over time in the participation behaviour of a particular enrolment category net of any age shift effects.

In algebraic form, for a given male or female enrolment category, the aggregate participation rate index is defined as:

$$I_t = \left[\frac{\sum_i \left[\frac{E_t^i}{P_t^i} P_{(1977-78)}^i \right]}{\sum_i E_{(1977-78)}^i} \right] .100$$

where: E_t = enrolment for a specific age-sex group, in year t .

P_t = population for a specific age-sex group, in year t .

I_t = index of aggregate participation rate.

t = 1972-73 to 1977-78.

i = 28 age groups, (single years 17-40, and 5-year bands to 55+).

The participation rate for an individual single-year age group of enrolment, by sex, within a given category of enrolment is E_t^i / P_t^i .

APPENDIX B

Methodology for Estimation of Adjusted Supply

APPENDIX B

METHODOLOGY FOR THE ESTIMATION OF ADJUSTED SUPPLY

The purpose of this appendix is to detail the methodology used to calculate the number of university graduates from all sources who are potential labour market entrants each year for the period 1972 to 1977. Not all graduates of Canadian universities are available to enter the labour market. Some are foreign students who must return to their home country. Others received their degrees on a part-time basis and are already members of the labour force⁽¹⁾. Still other graduates continue their education and are therefore, not available to take jobs. Thus, in order to calculate the number of graduates from Canadian universities potentially available to enter the labour force, the estimates of the number of degrees awarded are reduced by the number of (visa) foreign students returning home, part-time graduates, and students continuing their education.

In addition to graduates from Canadian universities as adjusted above, two other sources provide the country with graduates available for the labour market. These are Canadian students who have studied in another country and return home, and immigrants.

These adjustments have been carried out by use of data from Statistics Canada and the Canada Employment and Immigration Commission. The procedure used in these calculations is as follows:

1. Degrees Awarded from 1974 to 1977 by 70 fields of study (FOS) and 3 degree levels were obtained from Statistics Canada. Prior to 1974 the disaggregation by FOS was often not detailed enough to provide for 70 fields of study. When this was the case, the appropriate aggregate groups were broken into individual FOS using the 1973-74 distribution for the group.

(1) Full-time students with part-time jobs are considered, for purposes of this analysis, to be potential labour market entrants.

2. Degrees Awarded to Students remaining in Canada were estimated as follows:
 - (a) It was assumed that the percentage of degrees awarded to foreign students in a given FOS and degree level depends on the level of their enrolment relative to native Canadians. Accordingly, degrees awarded were multiplied by percent full-time (FT) foreign enrolment. Full-time foreign student enrolment was obtained from Statistics Canada.
 - (b) The result from (a) was subtracted from degrees awarded to produce degrees awarded to students remaining in Canada.
3. The number of Students Continuing their Education Full-Time for each field of study was estimated as follows:
 - (a) Canadian BAs continuing FT
$$= \text{BAs (from 2(b))} \times \frac{\% \text{ BAs continuing their education (from HQMPS)} \times \text{FT MA Enrolments}}{\text{Total MA Enrolments}}$$
 - (b) Canadian MAs continuing FT
$$= \text{MAs (from 2(b))} \times \frac{\% \text{ MAs continuing their education (from HQMPS)} \times \text{FT PhD Enrolments}}{\text{Total PhD Enrolments}}$$
 - (c) PhD = 0, since PhD is terminal degree
4. Degrees Awarded to Part-Time Students were calculated as follows:
 - (a) The number of students continuing their education on a full-time basis (from 3) were subtracted from the number of degrees awarded to students remaining in Canada 2(b). This step yields an estimate of degrees awarded to students finishing their education on a full-time basis plus part-time graduates.

(2) Highly Qualified Manpower Post-Censal Survey, Statistics Canada, 1973.

- (b) In order to calculate full-time students completing their full-time education the results from 4(a) were multiplied by the following ratio for each field of study:

Full-time Enrolment (Canadian)

Total Full-Time Equivalent (FTE) Enrolment (Canadian)
is derived in the following way:

- (i) Full-time (FT) enrolment Canadian
= FT enrolment X (1-% foreign enrolment
(from 2(a))
- (ii) Total FTE Enrolment (Canadian) =
FT Enrolment (Canadian) +
Part-time Enrolment (Canadian)
FTE Factor
as there are some foreign students studying on
a part-time basis.
- (iii) FTE Factor = 3.75 for BA and;
2.5 for MA and PhD
- (c) Part-time graduates were then calculated by
subtracting the results of 4(b) from 4(a).

It should be noted that this indirect method of calculation is likely to result in an overestimate of part-time graduates. The reason for this is that part-time enrolment is concentrated at the lower levels of enrolment, whereas the method used here assumes the same proportionate incidence throughout all levels of enrolment. (It would be possible, with additional effort, to derive direct estimates based on enrolments from Statistics Canada USIS file and the 1976 Survey of Graduates.)

5. Domestic supply = degrees awarded less degrees awarded to visa students (step 2(a) above), less degrees awarded to students continuing their education full-time (step 3 above), less part-time graduates (step 4 above).

6. Immigration by Field of Study (FOS) was estimated as follows:

- (a) Immigration by intended occupation data were obtained from the Employment and Immigration Commission for the years 1972 to 1976.
- (b) Non-HQM occupations were excluded.
- (c) For each year, each occupation was multiplied by the relevant percent degree requirement from the HQM demand model.
- (d) The resulting matrices (5 X 68) were then post-multiplied by each of the 3 planes of the occupation by education matrix of the HQM demand model⁽³⁾ (68 X 70) to produce three matrices (5 X 70) of immigration by FOS and degree level.

7. Number of Canadians Receiving Degrees Abroad and Returning to Canada

- (a) Table 10 of the HQMPS provides estimates by field of study of the number of persons born in Canada and residing in Canada by 3 categories:
 - 1) Receiving all degrees in Canada;
 - 2) Receiving all degrees abroad; and
 - 3) Receiving degrees both in Canada and abroad.
- (b) For most fields of study it was assumed that all people who earned degrees both in Canada and abroad earned their first level degree in Canada and their second or third level degree abroad. For all fields it was assumed that those people who earned all their degrees abroad were divided in first level versus second and third level according to the respective proportions for the FOS from Table 1 of the HQMPS⁽⁴⁾. For the following FOS, the first assumption (concerning degrees earned both in Canada and abroad) did not prove tenable:

(3) See "MOSST, HQM Demand Model, Methodology". This report is available on request from the Communications Services Division, Ministry of State for Science and Technology.

(4) Statistics Canada, "HQMPs Survey, 1973, Final Weighted Tables".

- 1) All Health
- 2) Architecture
- 3) General Science - No major
- 4) All Education
- 5) Law
- 6) Accounting

In all of these FOS (except 3) the first level degree is often obtained after a degree in another FOS. As well, advanced degrees are not offered in General Science - No Major.

Accordingly, for these FOS, the degrees earned by Canadian-born people whether all abroad or only partially abroad were assumed to be divided according to the same ratio of first to second and third levels of the total stock for the FOS according to Table 1.

- (c) The results of these calculations yield estimates of the first and advanced degree levels by FOS earned abroad by Canadians. These are divided by the relevant stock totals from Table 1 of the HQMPS to obtain ratios, which are then multiplied by the number of degrees awarded by FOS and level (BA vs MA + PhD) for each year to obtain an estimate of Canadians returning home. The advanced level degrees are then divided into MA vs PhD according to the ratio of MA vs PhD degrees awarded for each FOS for each year. (This is equivalent to multiplying the MA and PhD degrees awarded separately by the same ratio.)
8. Adjusted supply = domestic supply + immigration by field of study + the number of Canadians receiving degrees abroad and returning home, as shown in Tables B-1 to B-4. It should be noted that adjusted supply is likely to be slightly overestimated because the calculation did not take account of the number of Canadian graduates who emigrate, or leave Canada to continue their studies abroad.

APPENDIX TABLE B-1

COMPONENTS OF ADJUSTED SUPPLY BY MAJOR FIELD OF STUDY BA's - 1972

MAJOR FIELDS OF STUDY

| | DEGREES AWARDED | MINUS FOREIGN DEGREES AWARDED | EQUALS DEGS. AW. TO STUDENTS REM. IN CANADA | MINUS DEGS. AW. TO STUDENTS CONT. FT EDUCATION | MINUS PART TIME STUDENTS (1) | EQUALS DOMESTIC SUPPLY | PLUS CANADIANS RETURNING HOME | PLUS IMMIGRANTS | EQUALS ADJUSTED SUPPLY |
|--------------------------------------|--------------------|--|--|---|---------------------------------------|------------------------------|--|--------------------|------------------------------|
| HEALTH | 3,854 | 100 | 3,754 | 351 | 60 | 3,344 | 177 | 1,302 | 4,824 |
| ENGINEERING | 4,449 | 428 | 4,021 | 827 | 24 | 3,170 | 140 | 1,492 | 4,803 |
| LIFE SCIENCES | 4,519 | 171 | 4,348 | 1,436 | 22 | 2,891 | 71 | 377 | 3,340 |
| PHYSICAL SCIENCES AND MATHEMATICS | 4,188 | 276 | 3,912 | 1,221 | 86 | 2,604 | 45 | 564 | 3,211 |
| HUMANITIES AND FINE ARTS | 11,157 | 418 | 10,739 | 2,945 | 506 | 7,289 | 335 | 762 | 8,385 |
| EDUCATION | 16,019 | 210 | 15,809 | 1,494 | 1,656 | 12,660 | 985 | 886 | 14,531 |
| LAW | 2,152 | 110 | 2,042 | 209 | 2 | 1,831 | 94 | 66 | 1,992 |
| COMMERCE | 3,656 | 186 | 3,470 | 410 | 254 | 2,806 | 189 | 310 | 3,305 |
| SOCIAL SCIENCES | 14,549 | 743 | 13,806 | 3,766 | 790 | 9,253 | 239 | 590 | 10,080 |
| GENERAL ARTS | 8,020 | 409 | 7,611 | 5,237 | 331 | 2,043 | 73 | 205 | 2,321 |
| TOTAL | 72,563 | 3,051 | 69,512 | 17,896 | 3,731 | 47,891 | 2,348 | 6,554 | 56,792 |

NOTE: (1) Difference between degrees awarded to students completing their education and degrees awarded to FT students completing their FT education.

(2) Differences are due to rounding.

APPENDIX TABLE B-2

COMPONENTS OF ADJUSTED SUPPLY BY MAJOR FIELD OF STUDY BA's - 1977

MAJOR FIELDS OF STUDY

| | DEGREES -AWARDED | MINUS FOREIGN DEGREES AWARDED | EQUALS DEGS. AW. TO STUDENTS REM. IN CANADA | MINUS DEGS. AW. TO STUDENTS CONT. FT EDUCATION | MINUS PART TIME STUDENTS (1) | EQUALS DOMESTIC SUPPLY | PLUS CANADIANS RETURNING HOME | PLUS IMMIGRANTS | EQUALS ADJUSTED SUPPLY |
|--------------------------------------|---------------------|--|--|---|---------------------------------------|------------------------------|--|--------------------|------------------------------|
| HEALTH | 5,698 | 149 | 5,549 | 444 | 81 | 5,025 | 239 | 694 | 5,959 |
| ENGINEERING | 5,042 | 483 | 4,559 | 736 | 57 | 3,764 | 170 | 1,223 | 5,162 |
| LIFE SCIENCES | 6,439 | 245 | 6,195 | 1,981 | 134 | 4,080 | 103 | 250 | 4,437 |
| PHYSICAL SCIENCES AND MATHEMATICS | 4,187 | 276 | 3,911 | 1,055 | 107 | 2,749 | 42 | 402 | 3,193 |
| HUMANITIES AND FINE ARTS | 12,757 | 488 | 12,269 | 3,266 | 866 | 8,139 | 463 | 702 | 9,303 |
| EDUCATION | 19,853 | 258 | 19,595 | 1,321 | 2,026 | 16,248 | 1,223 | 629 | 18,099 |
| LAW | 2,707 | 138 | 2,569 | 162 | 11 | 2,396 | 118 | 68 | 2,582 |
| COMMERCE | 6,984 | 356 | 6,628 | 670 | 485 | 5,473 | 366 | 344 | 6,184 |
| SOCIAL SCIENCES | 15,703 | 801 | 14,902 | 3,714 | 1,178 | 10,011 | 256 | 465 | 10,732 |
| GENERAL ARTS | 7,725 | 394 | 7,331 | 5,044 | 276 | 2,011 | 70 | 186 | 2,267 |
| TOTAL | 87,095 | 3,588 | 83,508 | 18,393 | 5,221 | 59,896 | 3,055 | 4,968 | 67,918 |

NOTE: (1) Difference between degrees awarded to students completing their education and degrees awarded to FT students completing their FT education.

(2) Differences are due to rounding.

APPENDIX TABLE B-3

COMPONENTS OF ADJUSTED SUPPLY BY MAJOR FIELD OF STUDY GRADS - 1977

MAJOR FIELDS OF STUDY

| | DEGREES AWARDED | MINUS FOREIGN DEGREES AWARDED | EQUALS DEGS. AW. TO STUDENTS REM. IN CANADA | MINUS DEGS. AW. TO STUDENTS CONT. FT EDUCATION | MINUS PART TIME STUDENTS (1) | EQUALS DOMESTIC SUPPLY | PLUS CANADIANS RETURNING HOME | PLUS IMMIGRANTS | EQUALS ADJUSTED SUPPLY |
|--------------------------------------|--------------------|--|--|---|---------------------------------------|------------------------------|--|--------------------|------------------------------|
| HEALTH | 541 | 43 | 498 | 38 | 53 | 405 | 18 | 92 | 515 |
| ENGINEERING | 1,295 | 362 | 934 | 124 | 176 | 633 | 273 | 235 | 1,139 |
| LIFE SCIENCES | 894 | 162 | 733 | 112 | 54 | 567 | 199 | 100 | 868 |
| PHYSICAL SCIENCES AND MATHEMATICS | 1,310 | 314 | 996 | 148 | 98 | 750 | 186 | 212 | 1,144 |
| HUMANITIES AND FINE ARTS | 2,442 | 203 | 2,239 | 346 | 342 | 1,554 | 595 | 258 | 2,405 |
| EDUCATION | 2,767 | 428 | 2,339 | 167 | 1,091 | 1,081 | 170 | 84 | 1,335 |
| LAW | 150 | 17 | 133 | 6 | 48 | 79 | 6 | 11 | 96 |
| COMMERCE | 1,919 | 68 | 1,851 | 120 | 512 | 1,218 | 434 | 145 | 1,798 |
| SOCIAL SCIENCES | 2,763 | 489 | 2,274 | 286 | 344 | 1,643 | 454 | 272 | 2,367 |
| TOTAL | 14,081 | 2,086 | 11,997 | 1,347 | 2,718 | 7,930 | 2,335 | 1,409 | 11,667 |

NOTE: (1) Difference between degrees awarded to students completing their education and degrees awarded to FT students completing their FT education.

(2) Differences are due to rounding.

APPENDIX TABLE B-4

COMPONENTS OF ADJUSTED SUPPLY BY MAJOR FIELD OF STUDY GRADS - 1972

MAJOR FIELDS OF STUDY

| | DEGREES AWARDED | MINUS FOREIGN DEGREES AWARDED | EQUALS DEGS. AW. TO STUDENTS REM. IN CANADA | MINUS DEGS. AW. TO STUDENTS CONT. FT EDUCATION | MINUS PART TIME STUDENTS (1) | EQUALS DOMESTIC SUPPLY | PLUS CANADIANS RETURNING HOME | PLUS IMMIGRANTS | EQUALS ADJUSTED SUPPLY |
|--------------------------------------|--------------------|--|--|---|---------------------------------------|------------------------------|--|--------------------|------------------------------|
| HEALTH | 464 | 28 | 437 | 34 | 30 | 373 | 16 | 150 | 540 |
| ENGINEERING | 1,245 | 240 | 1,005 | 138 | 117 | 749 | 270 | 307 | 1,327 |
| LIFE SCIENCES | 836 | 93 | 743 | 113 | 50 | 580 | 188 | 157 | 922 |
| PHYSICAL SCIENCES AND MATHEMATICS | 1,481 | 196 | 1,286 | 181 | 85 | 1,019 | 214 | 319 | 1,552 |
| HUMANITIES AND FINE ARTS | 2,567 | 299 | 2,268 | 372 | 347 | 1,551 | 607 | 287 | 2,444 |
| EDUCATION | 1,830 | 163 | 1,667 | 153 | 596 | 919 | 111 | 127 | 1,157 |
| LAW | 38 | 4 | 34 | 1 | 9 | 24 | 1 | 13 | 39 |
| COMMERCE | 1,120 | 33 | 1,087 | 78 | 237 | 771 | 255 | 155 | 1,181 |
| SOCIAL SCIENCES | 2,411 | 254 | 2,157 | 268 | 276 | 1,612 | 370 | 375 | 2,358 |
| TOTAL | 11,992 | 1,310 | 10,684 | 1,338 | 1,747 | 7,598 | 2,032 | 1,890 | 11,520 |

NOTE: (1) Difference between degrees awarded to students completing their education and degrees awarded to FT students completing their FT education.

(2) Differences are due to rounding.

APPENDIX C

Undergraduate and Graduate Degrees
Awarded to Females By Discipline,
1972 and 1977.

APPENDIX TABLE C-1

UNDERGRADUATE AND FIRST PROFESSIONAL DEGREES AWARDED
TO FEMALES IN GENERAL ARTS AND SCIENCE

| <u>FIELD OF STUDY</u> | <u>1972</u> | <u>1977</u> |
|-----------------------------------|-------------|-------------|
| Life Sciences ¹ | 1213 | 2838 |
| Physical Sc. & Math. ² | 768 | 831 |
| Humanities & Fine Arts | 5696 | 7445 |
| Social Sciences ³ | 5088 | 7066 |
| General Arts | 3629 | 4175 |
| TOTAL | 16394 | 22355 |

NOTES: 1- Excludes Veterinary Medicine, includes Forestry
2- Excludes Computer Science, includes General Science
3- Excludes Social Work, Law, Commerce and Business
Administration

SOURCE: Data obtained from Education, Science and Culture
Division, Statistics Canada.

APPENDIX TABLE C-2

GRADUATE DEGREES AWARDED TO FEMALES IN GENERAL ARTS AND SCIENCE

| <u>FIELD OF STUDY</u> | <u>1972</u> | <u>1977</u> |
|-----------------------------------|-------------|-------------|
| Life Sciences ¹ | 153 | 219 |
| Physical Sc. & Math. ² | 105 | 147 |
| Humanities & Fine Arts | 994 | 1113 |
| Social Sciences ³ | 431 | 775 |
| TOTAL | 1683 | 2254 |

NOTES: 1- Excludes Veterinary Medicine, includes Forestry
2- Excludes Computer Science, includes General Science
3- Excludes Social Work, Law, Commerce and Business
Administration

SOURCE: Data obtained from Education, Science and Culture
Division, Statistics Canada.

APPENDIX TABLE C-3

UNDERGRADUATE AND FIRST PROFESSIONAL DEGREES AWARDED
TO FEMALES IN CAREER-ORIENTED FIELDS

| <u>FIELD OF STUDY</u> | <u>1972</u> | <u>1977</u> |
|--------------------------|-------------|-------------|
| Health | 1857 | 3198 |
| Engineering ¹ | 80 | 224 |
| Education | 8702 | 12485 |
| Law | 260 | 757 |
| Commerce | 318 | 1603 |
| Veterinary Medicine | 17 | 72 |
| Computer Science | 128 | 184 |
| Social Work | 226 | 746 |
| TOTAL | 11588 | 19269 |

NOTE: 1- Includes Architecture

SOURCE: Data obtained from Education, Science and Culture
Division, Statistics Canada.

APPENDIX TABLE C-4

GRADUATE DEGREES AWARDED TO FEMALES IN CAREER-ORIENTED FIELDS

| <u>FIELD OF STUDY</u> | <u>1972</u> | <u>1977</u> |
|--------------------------|-------------|-------------|
| Health | 136 | 274 |
| Engineering ¹ | 29 | 39 |
| Education | 482 | 1053 |
| Law | 6 | 16 |
| Commerce | 31 | 267 |
| Veterinary Medicine | - | 6 |
| Computer Science | 15 | 26 |
| Social Work | 312 | 250 |
| TOTAL | 1011 | 1931 |

NOTE: 1- Includes Architecture

SOURCE: Data obtained from Education, Science and Culture
Division, Statistics Canada.

